

APPENDIX A

Schedules and Recommendations

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Appendix A

A

Immunization Schedules on the Web

Childhood and Adolescent Immunization Schedule

Schedule: <http://www.cdc.gov/nip/recs/child-schedule.htm>

Contains:

- English and Spanish versions
- Color and black & white versions
- 4-page, 2-page, and pocket-size versions
- Palm OS and Pocket PC Handheld versions
- Screenreader accessible version
- Downloadable files for office printing or commercial printing
- Link to past years' schedules
- Interactive childhood vaccine scheduler
- more . . .

Adult Immunization Schedule Schedule: <http://www.cdc.gov/nip/recs/adult-schedule.htm>

Contains:

- Color and black & white versions
- 4-page, 2-page, and pocket-size versions
- Downloadable files for office printing or commercial printing
- Screenreader accessible version
- Summary of changes since last year's version
- Adult vaccination screening form
- Adult and adolescent vaccine "quiz"
- more . . .

Appendix A

DEPARTMENT OF HEALTH AND HUMAN SERVICES • CENTERS FOR DISEASE CONTROL AND PREVENTION

Recommended Immunization Schedule for Ages 0–6 Years UNITED STATES • 2007

Vaccine ▼	Age ►	Birth	1 month	2 months	4 months	6 months	12 months	15 months	18 months	19–23 months	2–3 years	4–6 years
Hepatitis B ¹	HepB	HepB	HepB	see footnote 1		HepB	HepB	HepB	HepB	HepB Series		
Rotavirus ²			Rota	Rota	Rota							
Diphtheria, Tetanus, Pertussis ³			DTaP	DTaP	DTaP		DTaP			DTaP		
Haemophilus influenzae type b ⁴			Hib	Hib	Hib ⁴	Hib		Hib				
Pneumococcal ⁵			PCV	PCV	PCV	PCV	PCV			PCV	PPV	
Inactivated Poliovirus			IPV	IPV		IPV					IPV	
Influenza ⁶						Influenza (Yearly)						
Measles, Mumps, Rubella ⁷						MMR				MMR		
Varicella ⁸						Varicella				Varicella		
Hepatitis A ⁹						HepA (2 doses)				HepA Series		
Meningococcal ¹⁰										MPSV4		

- Range of recommended ages
- Catch-up immunization
- Certain high-risk groups

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children through age 6 years. For additional information see www.cdc.gov/nip/recs/child-schedule.htm. Any dose not administered at the recommended age should be administered at any subsequent visit when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components

of the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective ACIP statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at www.vaers.hrsa.gov or by telephone, 800-822-7967.

1. Hepatitis B vaccine (HepB). (Minimum age: birth)

At birth:

- Administer monovalent HepB to all newborns prior to hospital discharge.
- If mother is HBsAg-positive, administer HepB and 0.5 mL of hepatitis B immune globulin (HBIG) within 12 hours of birth.
- If mother's HBsAg status is unknown, administer HepB within 12 hours of birth. Determine the HBsAg status as soon as possible and if HBsAg-positive, administer HBIG (no later than age 1 week).
- If mother is HBsAg-negative, the birth dose can only be delayed with physician's order and mothers' negative HBsAg laboratory report documented in the infant's medical record.

Following the birth dose:

- The HepB series should be completed with either monovalent HepB or a combination vaccine containing HepB. The second dose should be administered at age 1–2 months. The final dose should be administered at age ≥24 weeks. Infants born to HBsAg-positive mothers should be tested for HBsAg and antibody to HBsAg after completion of 3 or more doses in a licensed HepB series, at age 9–18 months (generally at the next well-child visit).

4-month dose of HepB:

- It is permissible to administer 4 doses of HepB when combination vaccines are given after the birth dose. If monovalent HepB is used for doses after the birth dose, a dose at age 4 months is not needed.

2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)

- Administer the first dose between 6 and 12 weeks of age. Do not start the series later than age 12 weeks.
- Administer the final dose in the series by 32 weeks of age. Do not administer a dose later than age 32 weeks.
- There are insufficient data on safety and efficacy outside of these age ranges.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). (Minimum age: 6 weeks)

- The fourth dose of DTaP may be administered as early as age 12 months, provided 6 months have elapsed since the third dose.
- Administer the final dose in the series at age 4–6 years.

4. Haemophilus influenzae type b conjugate vaccine (Hib). (Minimum age: 6 weeks)

- If PRP-OMP (PedvaxHIB® or ComVax® [Merck]) is administered at ages 2 and 4 months, a dose at age 6 months is not required.
- TriHibit® (DTaP/Hib) combination products should not be used for primary immunization but can be used as boosters following any Hib vaccine in ≥12 months old.

5. Pneumococcal vaccine. (Minimum age: 6 weeks for Pneumococcal Conjugate Vaccine (PCV); 2 years for Pneumococcal Polysaccharide Vaccine (PPV))

- Administer PCV at ages 24–59 months in certain high-risk groups. Administer PPV to certain high-risk groups aged ≥2 years. See *MMWR* 2000; 49(RR-9):1-35.

6. Influenza vaccine. (Minimum age: 6 months for trivalent inactivated influenza vaccine (TIV); 5 years for live, attenuated influenza vaccine (LAIV))

- All children aged 6–59 months and close contacts of all children aged 0–59 months are recommended to receive influenza vaccine.
- Influenza vaccine is recommended annually for children aged ≥59 months with certain risk factors, healthcare workers, and other persons (including household members) in close contact with persons at high risk. See *MMWR* 2006; 55(RR-10):1-41.
- For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
- Children receiving TIV should receive 0.25 mL if aged 6–35 months or 0.5 mL if aged ≥3 years.
- Children aged ≤9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).

7. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- Administer the second dose of MMR at age 4–6 years. MMR may be administered prior to age 4–6 years, provided ≥4 weeks have elapsed since the first dose and both doses are administered at age ≥12 months.

8. Varicella vaccine. (Minimum age: 12 months)

- Administer the second dose of varicella vaccine at age 4–6 years. Varicella vaccine may be administered prior to age 4–6 years, provided that ≥3 months have elapsed since the first dose and both doses are administered at age ≥12 months. If second dose was administered ≥28 days following the first dose, the second dose does not need to be repeated.

9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- HepA is recommended for all children at 1 year of age (i.e., 12–23 months). The 2 doses in the series should be administered at least 6 months apart.
- Children not fully vaccinated by age 2 years can be vaccinated at subsequent visits.
- HepA is recommended for certain other groups of children including in areas where vaccination programs target older children. See *MMWR* 2006; 55(RR-7):1-23.

10. Meningococcal polysaccharide vaccine (MPSV4). (Minimum age: 2 years)

- Administer MPSV4 to children aged 2–10 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high risk groups. See *MMWR* 2005; 54 (RR-7):1-21.

The Childhood and Adolescent Immunization Schedule is approved by:

Advisory Committee on Immunization Practices www.cdc.gov/nip/acip • American Academy of Pediatrics www.aap.org • American Academy of Family Physicians www.aafp.org

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DEPARTMENT OF HEALTH AND HUMAN SERVICES • CENTERS FOR DISEASE CONTROL AND PREVENTION

Recommended Immunization Schedule for Ages 7–18 Years UNITED STATES • 2007

Vaccine ▼	Age ►	7–10 years	11–12 YEARS	13–14 years	15 years	16–18 years
Tetanus, Diphtheria, Pertussis ¹	see footnote 1		Tdap		Tdap	
Human Papillomavirus ²	see footnote 2		HPV (3 doses)		HPV Series	
Meningococcal ³	MPSV4		MCV4		MCV4³	MCV4
Pneumococcal ⁴			PPV			
Influenza ⁵			Influenza (Yearly)			
Hepatitis A ⁶			HepA Series			
Hepatitis B ⁷			HepB Series			
Inactivated Poliovirus ⁸			IPV Series			
Measles, Mumps, Rubella ⁹			MMR Series			
Varicella ¹⁰			Varicella Series			

This schedule indicates the recommended ages for routine administration of currently licensed childhood vaccines, as of December 1, 2006, for children aged 7–18 years. For additional information see www.cdc.gov/nip/recs/child-schedule.htm. Any dose not administered at the recommended earlier age should be administered at any subsequent visit when indicated and feasible. Additional vaccines may be licensed and recommended during the year. Licensed combination vaccines may be used whenever any components of

the combination are indicated and other components of the vaccine are not contraindicated and if approved by the Food and Drug Administration for that dose of the series. Providers should consult the respective ACIP statement for detailed recommendations. Clinically significant adverse events that follow immunization should be reported to the Vaccine Adverse Event Reporting System (VAERS). Guidance about how to obtain and complete a VAERS form is available at www.vaers.hhs.gov or by telephone, 800-822-7967.

Range of recommended ages

Catch-up immunization

Certain high-risk groups

FOOTNOTES

1. Tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).

(Minimum age: 10 years for BOOSTRIX® and 11 years for ADACEL™)

- Administer at age 11–12 years for those who have completed the recommended childhood DTP/DTaP vaccination series and have not received a Td booster dose.
- Adolescents 13–18 years who missed the 11–12 year Td/Tdap booster dose should also receive a single dose of Tdap if they have completed the recommended childhood DTP/DTaP vaccination series.

2. Human papillomavirus vaccine (HPV). (Minimum age: 9 years)

- Administer the first dose of the HPV vaccine series to females at age 11–12 years.
- Administer the second dose 2 months after the first dose and the third dose 6 months after the first dose.
- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

3. Meningococcal vaccine. (Minimum age: 11 years for meningococcal conjugate vaccine (MCV4); 2 years for meningococcal polysaccharide vaccine (MPSV4))

- Administer MCV4 at age 11–12 years and to previously unvaccinated adolescents at high school entry (~15 years of age).
- Administer MCV4 to previously unvaccinated college freshmen living in dormitories; MPSV4 is an acceptable alternative.
- Vaccination against invasive meningococcal disease is recommended for children and adolescents aged ≥2 years with terminal complement deficiencies or anatomic or functional asplenia and certain other high risk groups. See MMWR 2005;54 (RR-7):1-21. Use MPSV4 for children aged 2–10 years and MCV4 or MPSV4 for older children.

4. Pneumococcal polysaccharide vaccine (PPV).

(Minimum age: 2 years)

- Administer for certain high-risk groups. See MMWR 1997; 46(RR-08); 1–24 and MMWR 2000; 49(RR-9):1-35.

5. Influenza vaccine. (Minimum age: 6 months for trivalent inactivated influenza vaccine (TIV); 5 years for live, attenuated influenza vaccine (LAIV)

• Influenza vaccine is recommended annually for persons with certain risk factors, healthcare workers, and other persons (including household members) in close contact with persons in groups at high risk. See MMWR 2006; 55(RR-10):1-41.

- For healthy persons aged 5–49 years, LAIV may be used as an alternative to TIV.
- Children aged ≤9 years who are receiving influenza vaccine for the first time should receive 2 doses (separated by ≥4 weeks for TIV and ≥6 weeks for LAIV).

6. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- The 2 doses in the series should be administered at least 6 months apart.
- HepA is recommended for certain other groups of children including in areas where vaccination programs target older children. See MMWR 2006; 55(RR-7):1-23.

7. Hepatitis B vaccine (HepB). (Minimum age: birth)

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB® is licensed for 11–15 year olds.

8. Inactivated poliovirus vaccine (IPV). (Minimum age: 6 weeks)

- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age ≥4 years.
- If both OPV and IPV were administered as part of a series, a total of 4 doses should be given, regardless of the child's current age.

9. Measles, mumps, and rubella vaccine (MMR).

(Minimum age: 12 months)

- If not previously vaccinated, administer 2 doses of MMR during any visit with ≥4 weeks between the doses.

10. Varicella vaccine. (Minimum age: 12 months)

- Administer 2 doses of varicella vaccine to persons without evidence of immunity.
- Administer 2 doses of varicella vaccine to persons aged <13 years at least 3 months apart. Do not repeat the second dose, if administered ≥28 days following the first dose.
- Administer 2 doses of varicella vaccine to persons aged ≥13 years at least 4 weeks apart.

Appendix A

Recommended Immunization Schedule for Children and Adolescents Who Start Late or Who Are More Than 1 Month Behind

UNITED STATES • 2007

The tables below give catch-up schedules and minimum intervals between doses for children who have delayed immunizations. There is no need to restart a vaccine series regardless of the time that has elapsed between doses. Use the table appropriate for the child's age.

CATCH-UP SCHEDULE FOR AGES 4 MONTHS THROUGH 6 YEARS					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Hepatitis B ¹	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Rotavirus ²	6 wks	4 weeks	4 weeks		
Diphtheria, Tetanus, Pertussis ³	6 wks	4 weeks	4 weeks	6 months	6 months³
<i>Haemophilus influenzae type b⁴</i>	6 wks	4 weeks if first dose given at age <12 months 8 weeks (as final dose) if first dose given at age 12–14 months No further doses needed if first dose given at age ≥15 months	4 weeks⁴ if current age <12 months 8 weeks (as final dose)⁴ if current age ≥12 months and second dose given at age <15 months No further doses needed if previous dose given at age ≥15 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Pneumococcal ⁵	6 wks	4 weeks if first dose given at age <12 months and current age <24 months 8 weeks (as final dose) if first dose given at age ≥12 months or current age 24–59 months No further doses needed for healthy children if first dose given at age ≥24 months	4 weeks if current age <12 months 8 weeks (as final dose) if current age ≥12 months No further doses needed for healthy children if previous dose given at age ≥24 months	8 weeks (as final dose) This dose only necessary for children aged 12 months–5 years who received 3 doses before age 12 months	
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	4 weeks⁶	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	3 months			
Hepatitis A ⁹	12 mos	6 months			
CATCH-UP SCHEDULE FOR AGES 7–18 YEARS					
Vaccine	Minimum Age for Dose 1	Minimum Interval Between Doses			
		Dose 1 to Dose 2	Dose 2 to Dose 3	Dose 3 to Dose 4	Dose 4 to Dose 5
Tetanus, Diphtheria/ Tetanus, Diphtheria, Pertussis ¹⁰	7 yrs ¹⁰	4 weeks	8 weeks if first dose given at age <12 months 6 months if first dose given at age ≥12 months	6 months if first dose given at age <12 months	
Human Papillomavirus ¹¹	9 yrs	4 weeks	12 weeks		
Hepatitis A ⁹	12 mos	6 months			
Hepatitis B ¹	Birth	4 weeks	8 weeks (and 16 weeks after first dose)		
Inactivated Poliovirus ⁶	6 wks	4 weeks	4 weeks	4 weeks⁶	
Measles, Mumps, Rubella ⁷	12 mos	4 weeks			
Varicella ⁸	12 mos	4 weeks if first dose given at age ≥13 years 3 months if first dose given at age <13 years			

1. Hepatitis B vaccine (HepB). (Minimum age: birth)

- Administer the 3-dose series to those who were not previously vaccinated.
- A 2-dose series of Recombivax HB® is licensed for 11–15 year olds.

2. Rotavirus vaccine (Rota). (Minimum age: 6 weeks)

- Do not start the series later than age 12 weeks.
- Administer the final dose in the series by 32 weeks of age. Do not administer a dose later than age 32 weeks.
- There are insufficient data on safety and efficacy outside of these age ranges.

3. Diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP). (Minimum age: 6 weeks)

- The fifth dose is not necessary if the fourth dose was administered at age ≥4 years.
- DTaP is not indicated for persons aged ≥7 years.

4. Haemophilus influenzae type b conjugate vaccine (Hib).

- (Minimum age: 6 weeks)
- Vaccine is not generally recommended for children aged ≥5 years.
 - If current age <12 months and the first 2 doses were PRP-OMP (PedvaxHIB® or ComVax® [Merck]), the third (and final) dose should be administered at age 12–15 months and at least 8 weeks after the second dose.
 - If first dose given at age 7–11 months, give 2 doses separated by 4 weeks plus a booster at age 12–15 months.

5. Pneumococcal conjugate vaccine (PCV). (Minimum age: 6 weeks)

- Vaccine is not generally recommended for children aged ≥5 years.

6. Inactivated poliovirus vaccine (IPV). (Minimum age: 6 weeks)

- For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was administered at age ≥4 years.
- If both OPV and IPV were administered as part of a series, a total of 4 doses should be

given, regardless of the child's current age.

7. Measles, mumps, and rubella vaccine (MMR). (Minimum age: 12 months)

- The second dose of MMR is recommended routinely at age 4–6 years but may be administered earlier if desired.
- If not previously vaccinated, administer 2 doses of MMR during any visit with ≥4 weeks between the doses.

8. Varicella vaccine. (Minimum age: 12 months)

- The second dose of varicella vaccine is recommended routinely at age 4–6 years but may be administered earlier if desired.
- Do not repeat the second dose in persons aged <13 years, if administered ≥28 days following the first dose.

9. Hepatitis A vaccine (HepA). (Minimum age: 12 months)

- HepA is recommended for certain groups of children including in areas where vaccination programs target older children. See MMWR 2006; SS (RR-7) 1–23.

10. Tetanus and diphtheria toxoids vaccine (Td) and tetanus and diphtheria toxoids and acellular pertussis vaccine (Tdap).

- (Minimum ages: 7 years for Td, 10 years for BOOSTRIX®, and 11 years for ADACEL™)
- Tdap should be substituted for a single dose of Td in the primary catch-up series or as a booster if age-appropriate; use Td for other doses.
 - A five-year interval from the last Td dose is encouraged when Tdap is used as a booster dose. A booster (4th) dose is needed if any of the previous doses were administered at age <12 months. Refer to ACIP recommendations for further information. See MMWR 2006; SS (RR-3) L34.

11. Human papillomavirus vaccine (HPV). (Minimum age: 9 years)

- Administer the HPV vaccine series to females at age 13–18 years if not previously vaccinated.

For information on reporting reactions following immunization, visit www.vaers.hhs.gov or call the 24-hour national toll-free information line 800-822-7967. Report suspected cases of vaccine-preventable diseases to your state or local health

department. For additional information including precautions and contraindications for immunization, visit the National Center for Immunization and Respiratory Diseases at www.cdc.gov/hicrd or contact 800-CDC-INFO (800-232-4636).

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Recommended Adult Immunization Schedule, by Vaccine and Age Group
UNITED STATES • OCTOBER 2006–SEPTEMBER 2007

Vaccine ▼	Age group ►	19–49 years	50–64 years	≥65 years
Tetanus, diphtheria, pertussis (Td/Tdap) ^{1,*}			1-dose Td booster every 10 yrs	
Human papillomavirus (HPV) ²	3 doses (females)			
Measles, mumps, rubella (MMR) ^{3,*}	1 or 2 doses		1 dose	
Varicella ^{4,*}	2 doses (0, 4–8 wks)		2 doses (0, 4–8 wks)	
Influenza ^{5,*}		1 dose annually		1 dose annually
Pneumococcal (polysaccharide) ^{6,7}		1–2 doses		1 dose
Hepatitis A ^{8,*}			2 doses (0, 6–12 mos, or 0, 6–18 mos)	
Hepatitis B ^{9,*}			3 doses (0, 1–2, 4–6 mos)	
Meningococcal ¹⁰				1 or more doses

*Covered by the Vaccine Injury Compensation Program. NOTE: These recommendations must be read with the footnotes (see reverse).

This schedule indicates the recommended age groups and medical indications for routine administration of currently licensed vaccines for persons aged ≥19 years, as of October 1, 2006. Licensed combination vaccines may be used whenever any components of the combination are indicated and when the vaccine's other components are not contraindicated. For detailed recommendations on all vaccines, including those used primarily for travelers or that are issued during the year, consult the manufacturers' package inserts and the complete statements from the Advisory Committee on Immunization Practices (www.cdc.gov/nip/publications/acip-list.htm).

Report all clinically significant postvaccination reactions to the Vaccine Adverse Event Reporting System (VAERS). Reporting forms and instructions on filing a VAERS report are available at www.vaers.hrsa.gov or by telephone, 800-822-7867.

Information on how to file a Vaccine Injury Compensation Program claim is available at www.hrsa.gov/vaccinecompensation or by telephone, 202-357-6400. Additional information about the vaccines in this schedule and contraindications for vaccination is also available at www.cdc.gov/hip or from the CDC-INFO Contact Center at 800-CDC-INFO (800-232-4636) in English and Spanish, 24 hours a day, 7 days a week.

Appendix A

Recommended Adult Immunization Schedule, by Vaccine and Medical and Other Indications UNITED STATES • OCTOBER 2006–SEPTEMBER 2007

Vaccine ▼	Indication ►	Congenital immunodeficiency, leukemia, ¹¹ lymphoma, generalized malignancy, cerebrospinal fluid leaks; therapy with alkylating agents, antimetabolites, radiation, or high-dose, long-term corticosteroids	Diabetes, heart disease, chronic pulmonary disease, chronic alcoholism	Asplenia ¹¹ (including elective splenectomy and terminal complement component deficiencies)	Chronic liver disease, recipients of clotting factor concentrates	Kidney failure, end-stage renal disease, recipients of hemodialysis	Human immunodeficiency virus (HIV) ¹¹	Healthcare workers
Tetanus, diphtheria, pertussis (T/d/Tdap).^{1,*}								
Human papillomavirus (HPV) ²					3 doses for females through age 26 yrs (0, 2, 6 mos)			
Measles, mumps, rubella (MMR) ^{3,*}					2 doses (0, 4–8 wks)			
Varicella ^{4,*}					1 dose annually	1 dose annually	2 doses	
Influenza ^{5,*}						1 dose annually		
Pneumococcal (polysaccharide) ^{6,7}					1–2 doses		1–2 doses	
Hepatitis A ^{8,*}					2 doses (0, 6–12 mos, or 0, 6–18 mos)	2 doses	2 doses (0, 6–12 mos, or 0, 6–18 mos)	
Hepatitis B ^{9,*}					3 doses (0, 1–2, 4–6 mos)		3 doses (0, 1–2, 4–6 mos)	
Meningococcal ¹⁰					1 dose		1 dose	

*Covered by the Vaccine Injury Compensation Program. NOTE: These recommendations must be read with the footnotes (see reverse).

Recommended if some other risk factor is present (e.g., on the basis of medical, occupational, lifestyle, or other indications)

Contraindicated

Approved by
the Advisory Committee on Immunization Practices,
the American College of Obstetricians and Gynecologists,
the American Academy of Family Physicians,
and the American College of Physicians



Centers for Disease Control and Prevention

Footnotes**Recommended Adult Immunization Schedule • UNITED STATES, OCTOBER 2006–SEPTEMBER 2007**

- 1. Tetanus, diphtheria, and acellular pertussis (Td/Tdap) vaccination.** Adults with uncertain histories of a complete primary vaccination series with diphtheria and tetanus toxoid-containing vaccines should begin or complete a primary vaccination series. A primary series for adults is 3 doses; administer the first 2 doses at least 4 weeks apart and the third dose 6–12 months after the second. Administer a booster dose to adults who have completed a primary series and if the last vaccination was received ≥10 years previously. Tdap or tetanus and diphtheria (Td) vaccine may be used; Tdap should replace a single dose of Td for adults aged <65 years who have not previously received a dose of Tdap (either in the primary series, as a booster, or for wound management). Only one of two Tdap products (Adacel® [sanofi pasteur]) is licensed for use in adults. If the person is pregnant and received the last Td vaccination ≥10 years previously, administer Td during the second or third trimester; if the person received the last Td vaccination in <10 years, administer Tdap during the immediate postpartum period. A one-time administration of 1 dose of Tdap with an interval as short as 2 years from a previous Td vaccination is recommended for postpartum women, close contacts of infants aged <12 months, and all healthcare workers with direct patient contact. In certain situations, Td can be deferred during pregnancy and Tdap substituted in the immediate postpartum period, or Tdap can be given instead of Td to a pregnant woman after an informed discussion with the woman (see www.cdc.gov/nip/publications/acip-list.htm). Consult the ACIP statement for recommendations for administering Td as prophylaxis in wound management (www.cdc.gov/mmwr/preview/mmwrhtml/00041645.htm).
- 2. Human papillomavirus (HPV) vaccination.** HPV vaccination is recommended for all women aged ≤26 years who have not completed the vaccine series. Ideally, vaccine should be administered before potential exposure to HPV through sexual activity; however, women who are sexually active should still be vaccinated. Sexually active women who have not been infected with any of the HPV vaccine types receive the full benefit of the vaccination. Vaccination is less beneficial for women who have already been infected with one or more of the four HPV vaccine types. A complete series consists of 3 doses. The second dose should be administered 2 months after the first dose; the third dose should be administered 6 months after the first dose. Vaccination is not recommended during pregnancy. If a woman is found to be pregnant after initiating the vaccination series, the remainder of the 3-dose regimen should be delayed until after completion of the pregnancy.
- 3. Measles, mumps, rubella (MMR) vaccination.** *Measles component:* adults born before 1957 can be considered immune to measles. Adults born during or after 1957 should receive ≥1 dose of MMR unless they have a medical contraindication, documentation of ≥1 dose, history of measles based on healthcare provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) have been recently exposed to measles or in an outbreak setting; 2) have been previously vaccinated with killed measles vaccine; 3) have been vaccinated with an unknown type of measles vaccine during 1963–1967; 4) are students in postsecondary educational institutions; 5) work in a healthcare facility; or 6) plan to travel internationally. Withhold MMR or other measles-containing vaccines from HIV-infected persons with severe immunosuppression.
- Mumps component:* adults born before 1957 can generally be considered immune to mumps. Adults born during or after 1957 should receive 1 dose of MMR unless they have a medical contraindication, history of mumps based on healthcare provider diagnosis, or laboratory evidence of immunity. A second dose of MMR is recommended for adults who 1) are in an age group that is affected during a mumps outbreak; 2) are students in postsecondary educational institutions; 3) work in a healthcare facility; or 4) plan to travel internationally. For unvaccinated healthcare workers born before 1957 who do not have other evidence of mumps immunity, consider giving 1 dose on a routine basis and strongly consider giving a second dose during an outbreak. *Rubella component:* administer 1 dose of MMR vaccine to women whose rubella vaccination history is unreliable or who lack laboratory evidence of immunity. For women of childbearing age, regardless of birth year, routinely determine rubella immunity and counsel women regarding congenital rubella syndrome. Do not vaccinate women who are pregnant or who might become pregnant within 4 weeks of receiving vaccine. Women who do not have evidence of immunity should receive MMR vaccine upon completion or termination of pregnancy and before discharge from the healthcare facility.
- 4. Varicella vaccination.** All adults without evidence of immunity to varicella should receive 2 doses of varicella vaccine. Special consideration should be given to those who 1) have close contact with persons at high risk for severe disease (e.g., healthcare workers and family contacts of immunocompromised persons) or 2) are at high risk for exposure or transmission (e.g., teachers of young children; child care employees; residents and staff members of institutional settings, including correctional institutions; college students; military personnel; adolescents and adults living in households with children; nonpregnant women of childbearing age; and international travelers). Evidence of immunity to varicella in adults includes any of the following: 1) documentation of 2 doses of varicella vaccine at least 4 weeks apart; 2) U.S.-born before 1980 (although for healthcare workers and pregnant women, birth before 1980 should not be considered evidence of immunity); 3) history of varicella based on diagnosis or verification of varicella by a healthcare provider (for a patient reporting a history of or presenting with an atypical case, a mild case, or both, healthcare providers should seek either an epidemiologic link with a typical varicella case or evidence of laboratory confirmation, if it was performed at the time of acute disease); 4) history of herpes zoster based on healthcare provider diagnosis; or 5) laboratory evidence of immunity or laboratory confirmation of disease. Do not vaccinate women who are pregnant or might become pregnant within 4 weeks of receiving the vaccine. Assess pregnant women for evidence of varicella immunity. Women who do not have evidence of immunity should receive dose 1 of varicella vaccine upon completion or termination of pregnancy and before discharge from the healthcare facility. Dose 2 should be administered 4–8 weeks after dose 1.
- 5. Influenza vaccination.** *Medical indications:* chronic disorders of the cardiovascular or pulmonary systems, including asthma; chronic metabolic diseases, including diabetes mellitus, renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or HIV); any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, or seizure disorder or other neuromuscular disorder); and pregnancy during the influenza season. No data exist on the risk for severe or complicated influenza disease among persons with asplenia; however, influenza is a risk factor for secondary bacterial infections that can cause severe disease among persons with asplenia. *Occupational indications:* healthcare workers and employees of long-term-care and assisted living facilities. *Other indications:* residents of nursing homes and other long-term-care and assisted living facilities; persons likely to transmit influenza to persons at high risk (e.g., in-home household contacts and caregivers of children aged 0–59 months, or persons of all ages with high-risk conditions); and anyone who would like to be vaccinated. Healthy, nonpregnant persons aged 5–49 years without high-risk medical conditions who are not contacts of severely immunocompromised persons in special care units can receive either intranasally administered influenza vaccine (FluMist®) or inactivated vaccine. Other persons should receive the inactivated vaccine.
- 6. Pneumococcal polysaccharide vaccination.** *Medical indications:* chronic disorders of the pulmonary system (excluding asthma); cardiovascular diseases; diabetes mellitus; chronic liver diseases, including liver disease as a result of alcohol abuse (e.g., cirrhosis); chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy [if elective splenectomy is planned, vaccinate at least 2 weeks before surgery]); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection [vaccinate as close to diagnosis as possible when CD4 cell counts are highest], leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids; and cochlear implants. *Other indications:* Alaska Natives and certain American Indian populations and residents of nursing homes or other long-term-care facilities.
- 7. Revaccination with pneumococcal polysaccharide vaccine.** One-time revaccination after 5 years for persons with chronic renal failure or nephrotic syndrome; functional or anatomic asplenia (e.g., sickle cell disease or splenectomy); immunosuppressive conditions (e.g., congenital immunodeficiency, HIV infection, leukemia, lymphoma, multiple myeloma, Hodgkin disease, generalized malignancy, or organ or bone marrow transplantation); or chemotherapy with alkylating agents, antimetabolites, or high-dose, long-term corticosteroids. For persons aged ≥65 years, one-time revaccination if they were vaccinated ≥5 years previously and were aged <65 years at the time of primary vaccination.
- 8. Hepatitis A vaccination.** *Medical indications:* persons with chronic liver disease and persons who receive clotting factor concentrates. *Behavioral indications:* men who have sex with men and persons who use illegal drugs. *Occupational indications:* persons working with hepatitis A virus (HAV)-infected primates or with HAV in a research laboratory setting. *Other indications:* persons traveling to or working in countries that have high or intermediate endemicity of hepatitis A (a list of countries is available at www.cdc.gov/travel/diseases.htm) and any person who would like to obtain immunity. Current vaccines should be administered in a 2-dose schedule at either 0 and 6–12 months, or 0 and 6–18 months. If the combined hepatitis A and hepatitis B vaccine is used, administer 3 doses at 0, 1, and 6 months.
- 9. Hepatitis B vaccination.** *Medical indications:* persons with end-stage renal disease, including patients receiving hemodialysis; persons seeking evaluation or treatment for a sexually transmitted disease (STD); persons with HIV infection; persons with chronic liver disease; and persons who receive clotting factor concentrates. *Occupational indications:* healthcare workers and public-safety workers who are exposed to blood or other potentially infectious body fluids. *Behavioral indications:* sexually active persons who are not in a long-term, mutually monogamous relationship (i.e., persons with >1 sex partner during the previous 6 months); current or recent injection-drug users; and men who have sex with men. *Other indications:* household contacts and sex partners of persons with chronic hepatitis B virus (HBV) infection; clients and staff members of institutions for persons with developmental disabilities; all clients of STD clinics; international travelers to countries with high or intermediate prevalence of chronic HBV infection (a list of countries is available at www.cdc.gov/travel/diseases.htm); and any adult seeking protection from HBV infection. Settings where hepatitis B vaccination is recommended for all adults: STD treatment facilities; HIV testing and treatment facilities; facilities providing drug-abuse treatment and prevention services; healthcare settings providing services for injection-drug users or men who have sex with men; correctional facilities; end-stage renal disease programs and facilities for chronic hemodialysis patients; and institutions and nonresidential daycare facilities for persons with developmental disabilities. *Special formulation indications:* for adult patients receiving hemodialysis and other immunocompromised adults, 1 dose of 40 µg/mL (Recombivax HB®) or 2 doses of 20 µg/mL (Engerix-B®).
- 10. Meningococcal vaccination.** *Medical indications:* adults with anatomic or functional asplenia, or terminal complement component deficiencies. *Other indications:* first-year college students living in dormitories; microbiologists who are routinely exposed to isolates of *Neisseria meningitidis*; military recruits; and persons who travel to or live in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the “meningitis belt” of sub-Saharan Africa during the dry season [December–June]), particularly if their contact with local populations will be prolonged. Vaccination is required by the government of Saudi Arabia for all travelers to Mecca during the annual Hajj. Meningococcal conjugate vaccine is preferred for adults with any of the preceding indications who are aged ≤55 years, although meningococcal polysaccharide vaccine (MPSV4) is an acceptable alternative. Revaccination after 5 years might be indicated for adults previously vaccinated with MPSV4 who remain at high risk for infection (e.g., persons residing in areas in which disease is epidemic).
- 11. Selected conditions for which *Haemophilus influenzae* type b (Hib) vaccine may be used.** Hib conjugate vaccines are licensed for children aged 6 weeks–71 months. No efficacy data are available on which to base a recommendation concerning use of Hib vaccine for older children and adults with the chronic conditions associated with an increased risk for Hib disease. However, studies suggest good immunogenicity in patients who have sickle cell disease, leukemia, or HIV infection or who have had splenectomies; administering vaccine to these patients is not contraindicated.

Appendix A

Recommended and Minimum Ages and Intervals Between Doses of Routinely Recommended Vaccines ¹				
Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
Hepatitis B (HepB)-1 ²	Birth	Birth	1-4 months	4 weeks
HepB-2	1-2 months	4 weeks	2-17 months	8 weeks
HepB-3 ³	6-18 months	24 weeks	—	—
Diphtheria-tetanus-acellular pertussis (DTaP)-1 ²	2 months	6 weeks	2 months	4 weeks
DTaP-2	4 months	10 weeks	2 months	4 weeks
DTaP-3	6 months	14 weeks	6-12 months ⁴	6 months ^{4,5}
DTaP-4	15-18 months	12 months	3 years	6 months ⁴
DTaP-5	4-6 years	4 years	—	—
<i>Haemophilus influenzae type b (Hib)-1^{2,6}</i>	2 months	6 weeks	2 months	4 weeks
Hib-2	4 months	10 weeks	2 months	4 weeks
Hib-3 ⁷	6 months	14 weeks	6-9 months ⁴	8 weeks
Hib-4	12-15 months	12 months	—	—
Inactivated poliovirus (IPV)-1 ²	2 months	6 weeks	2 months	4 weeks
IPV-2	4 months	10 weeks	2-14 months	4 weeks
IPV-3	6-18 months	14 weeks	3-5 years	4 weeks
IPV-4	4-6 years	18 weeks	—	—
Pneumococcal conjugate (PCV)-1 ⁶	2 months	6 weeks	2 months	4 weeks
PCV-2	4 months	10 weeks	2 months	4 weeks
PCV-3	6 months	14 weeks	6 months	8 weeks
PCV-4	12-15 months	12 months	—	—
Measles-mumps-rubella (MMR)-1 ⁸	12-15 months	12 months	3-5 years	4 weeks
MMR-2 ⁸	4-6 years	13 months	—	—
Varicella (Var)-1 ⁸	12-15 months	12 months	3-5 years	12 weeks ⁹
Var-2 ⁸	4-6 years	15 months	—	—
Hepatitis A (HepA)-1 ²	12-23 months	12 months	6-18 months ⁴	6 months ⁴
HepA-2	18-41 months	18 months	—	—
Influenza, Inactivated (TIV) ¹⁰	6-59 months	6 months ¹¹	1 month	4 weeks
Influenza, Live attenuated (LAIV) ¹⁰	—	5 years	6-10 weeks	6 weeks
Meningococcal Conjugate (MCV)	11-12 years	11 years	—	—
Meningococcal Polysaccharide (MPSV)-1	—	2 years	5 years ¹²	5 years ¹²
MPSV-2 ¹³	—	7 years	—	—
Tetanus-diphtheria (Td)	11-12 years	7 years	10 years	5 years
Tetanus-diphtheria-acellular pertussis (Tdap) ¹⁴	≥11 years	10 years	—	—
Pneumococcal polysaccharide (PPV)-1	—	2 years	5 years	5 years
PPV-2 ¹⁵	—	7 years	—	—

Appendix A

Vaccine and dose number	Recommended age for this dose	Minimum age for this dose	Recommended interval to next dose	Minimum interval to next dose
Human papillomavirus (HPV)-1 ¹⁶	11-12 years	9 years	2 months	4 weeks
HPV-2	11-12 years (+2 months)	109 months	4 months	12 weeks
HPV-3	11-12 years (+6 months)	112 months	—	—
Rotavirus (RV)-1 ¹⁷	2 months	6 weeks	2 months	4 weeks
RV-2	4 months	10 weeks	2 months	4 weeks
RV-3	6 months	14 weeks	—	—
Zoster ¹⁸	60 years	60 years	—	—

- 1 Use of licensed combination vaccines is preferred over separate injections of their equivalent component vaccines. (CDC. Combination vaccines for childhood immunization: recommendations of the Advisory Committee on Immunization Practices [ACIP], the American Academy of Pediatrics [AAP], and the American Academy of Family Physicians [AAFP]. *MMWR* 1999;48[No. RR-5]). When administering combination vaccines, the minimum age for administration is the oldest age for any of the individual components; the minimum interval between doses is equal to the greatest interval of any of the individual components.
- 2 Combination vaccines containing the Hepatitis B component are available (HepB-Hib, DTaP-HepB-IPV, HepA-HepB). These vaccines should not be administered to infants younger than 6 weeks of age because of the other components (i.e., Hib, DTaP, IPV, and HepA).
- 3 HepB-3 should be administered at least 8 weeks after HepB-2 and at least 16 weeks after HepB-1, and it should not be administered before age 24 weeks.
- 4 Calendar months.
- 5 The minimum recommended interval between DTaP-3 and DTaP-4 is 6 months. However, DTaP-4 need not be repeated if administered at least 4 months after DTaP-3.
- 6 For Hib and PCV, children receiving the first dose of vaccine at age 7 months of age or older require fewer doses to complete the series (CDC. Recommended childhood and adolescent immunization schedule – United States, 2006. *MMWR* 2005; 54 [Nos. 51 & 52]:Q1-Q4).
- 7 If PRP-OMP (Pedvax-Hib®, Merck Vaccine Division), was administered at 2 and 4 months of age a dose at 6 months of age is not required.
- 8 Combination measles-mumps-rubella-varicella (MMRV) vaccine can be used for children 12 months through 12 years of age. Also see footnote 9.
- 9 The minimum interval from Var-1 to Var-2 for persons beginning the series at 13 years or older is 4 weeks.
- 10 Two doses of influenza vaccine are recommended for children younger than 9 years of age who are receiving the vaccine for the first time. Children younger than 9 years who have previously received influenza vaccine, and persons 9 years of age and older, require only one dose per influenza season.
- 11 The minimum age for inactivated influenza vaccine varies by vaccine manufacturer. Only Fluzone (manufactured by sanofi pasteur) is approved for children 6-35 months of age. The minimum age for Fluvirin (manufactured by Novartis) is 4 years. For Fluarix and FluLaval (manufactured by GlaxoSmithKline), the minimum age is 18 years.
- 12 Some experts recommend a second dose of MPSV 3 years after the first dose for people at increased risk for meningococcal disease.
- 13 A second dose of meningococcal vaccine is recommended for people previously vaccinated with MPSV who remain at high risk for meningococcal disease. MCV is preferred when revaccinating persons aged 11-55 years, but a second dose of MPSV is acceptable. (CDC. Prevention and Control of Meningococcal Disease Recommendations of the Advisory Committee on Immunization Practices [ACIP]. *MMWR* 2005; 54: No. RR-7.)
- 14 Only one dose of Tdap is recommended. Subsequent doses should be administered as Td. If vaccination to prevent tetanus and/or diphtheria disease is required for children 7 through 9 years of age, Td should be administered (minimum age for Td is 7 years). For one brand of Tdap the minimum age is 11 years. The preferred interval between Tdap and a previous dose of Td is 5 years. In persons who have received a primary series of tetanus-toxoid containing vaccine, for management of a tetanus-prone wound, the minimum interval after a previous dose of any tetanus-containing vaccine is 5 years.
- 15 A second dose of PPV is recommended for persons at highest risk for serious pneumococcal infection and those who are likely to have a rapid decline in pneumococcal antibody concentration. Revaccination 3 years after the previous dose can be considered for children at highest risk for severe pneumococcal infection who would be younger than 10 years of age at the time of revaccination. (CDC. Prevention of pneumococcal disease: recommendations of the Advisory Committee on Immunization Practices [ACIP]. *MMWR* 1997;46[No. RR-8]).
- 16 HPV is approved only for females 9-26 years of age.
- 17 The first dose of RV must be administered at 6-12 weeks of age. The vaccine series should not be started at 13 weeks of age or older. RV should not be administered to children 33 weeks of age or older regardless of the number of doses received between 6 and 32 weeks of age.
- 18 Herpes zoster vaccine is approved as a single dose for persons 60 years and older with a history of varicella.

Adapted from Table 1, ACIP General Recommendations on Immunization: *MMWR* 2006;55(No. RR-15)

December 2006

Appendix A

Summary of Recommendations for Childhood and Adolescent Immunization

Adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP)* by the Immunization Action Coalition, November 2006

Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and other related issues	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B <i>Give IM</i>	<ul style="list-style-type: none"> Vaccinate all newborns with monovalent vaccine prior to hospital discharge. Give dose #2 at 1-2m and the final dose at 6-18m (the last dose in the infant series should not be given earlier than age 24wks). After the birth dose, the series may be completed using 2 doses of single-antigen vaccine or up to 3 doses of Comvax (ages 2m, 4m, 12-15m) or Pediarix (ages 2m, 4m, 6m), which may result in giving a total of 4 doses of hepatitis B vaccine. If mother is HBsAg-positive: give the newborn HBIG + dose #1 within 12hrs of birth; complete series at age 6m or, if using Comvax, at 12-15m. If mother's HBsAg status is unknown: give the newborn dose #1 within 12hrs of birth. If mother is subsequently found to be HBsAg positive, give infant HBIG within 7d of birth and follow the schedule for infants born to HBsAg-positive mothers. 	<ul style="list-style-type: none"> Do not restart series, no matter how long since previous dose. <ul style="list-style-type: none"> 3-dose series can be started at any age. Minimum spacing between doses: 4wks between #1 and #2, 8wks between #2 and #3, and at least 16wks between #1 and #3 (e.g., 0-, 2-, 4m; 0-, 1-, 4m). 	Contraindication: Previous anaphylaxis to this vaccine or to any of its components. Precaution Moderate or severe acute illness.
	Special Notes on Hepatitis B Vaccine (HepB) Dosing of HepB: Vaccine brands are interchangeable. For persons ages 0 through 19yrs, give 0.5 mL of either Engerix-B or Recombivax HB.		
	Alternative dosing schedule for unvaccinated adolescents ages 11 through 15yrs: Give 2 doses Recombivax HB 1.0mL (adult formulation) spaced 4-6m apart. (Engerix-B is not licensed for a 2-dose schedule.) For preterm infants: Consult ACIP hepatitis B recommendations (MMWR 2005; 54 [RR-16]).		
DtaP, DT <i>(Diphtheria, tetanus, acellular pertussis)</i> <i>Give IM</i>	<ul style="list-style-type: none"> Give to children at ages 2m, 4m, 6m, 15-18m, 4-6yrs. May give dose #1 as early as age 6wks. May give #4 as early as age 12m if 6m have elapsed since #3 and the child is unlikely to return at age 15-18m. Do not give DtaP/DT to children age 7yrs and older. If possible, use the same DtaP product for all doses. 	<ul style="list-style-type: none"> #2 and #3, may be given 4wks after previous dose. <ul style="list-style-type: none"> #4 may be given 6m after #3. If #4 is given before 4th birthday, wait at least 6m for #5 (age 4-6yrs). If #4 is given after 4th birthday, #5 is not needed. 	Contraindications <ul style="list-style-type: none"> Previous anaphylaxis to this vaccine or to any of its components. For DTaP/Tdap only: encephalopathy within 7d after DTaP/DTaP. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Gullain-Barré syndrome within 6wks after previous dose of tetanus toxoid-containing vaccine. For DTaP only: Any of these occurrences following a previous dose of DTaP/DTaP: 1) temperature of 105°F (40.5°C) or higher within 48hrs; 2) continuous crying for 3hrs or more within 48hrs; 3) collapse or shock-like state within 48hrs; 4) convolution with or without fever within 3d. For DTaP/Tdap only: Unstable neurologic disorder. Note: Use of Td or Tdap is not contraindicated in pregnancy. At the provider's discretion, either vaccine may be administered during the 2nd or 3rd trimester.
Td, Tdap <i>(Tetanus, diphtheria, acellular pertussis)</i> <i>Give IM</i>	<ul style="list-style-type: none"> Give Tdap booster dose to adolescents age 11-12yrs if 5yrs have elapsed since last dose DTaP/DTp; boost every 10yrs with Td. Give 1-time Tdap to all adolescents who have not received previous Tdap. Special efforts should be made to give Tdap to persons age 11yrs and older who are <ul style="list-style-type: none"> in contact with infants younger than age 12m. healthcare workers with direct patient contact. In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period. 	<ul style="list-style-type: none"> Give Tdap booster dose to adolescents age 11-12yrs if 5yrs have elapsed since last dose DTaP/DTp; boost every 10yrs with Td. Give 1-time Tdap to all adolescents who have not received previous Tdap. Special efforts should be made to give Tdap to persons age 11yrs and older who are <ul style="list-style-type: none"> in contact with infants younger than age 12m. healthcare workers with direct patient contact. In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. 	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Pregnancy.
Polio <i>(IPV)</i> <i>Give SC or IM</i>	<ul style="list-style-type: none"> Give to children at ages 2m, 4m, 6-18m, 4-6yrs. May give #1 as early as age 6wks. Not routinely recommended for those age 18yrs and older (except certain travelers). 	<ul style="list-style-type: none"> All doses should be separated by at least 4wks. If dose #3 is given after 4th birthday, dose #4 is not needed. 	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Pregnancy.
Human Papillomavirus (HPV) <i>Give IM</i>	<ul style="list-style-type: none"> Give 3-dose series to girls at age 11-12yrs on a 0, 2, 6m schedule. May be given as early as age 9yrs. Vaccinate all older females (through age 26yrs) not previously vaccinated. 	<ul style="list-style-type: none"> Dose #2 may be given 4wks after dose #1. Dose #3 may be given 12wks after dose #2. 	Contraindication Previous anaphylaxis to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Pregnancy.

*For specific ACIP recommendations, refer to the official ACIP statements published in MMWR. To obtain copies of these statements, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC's website at www.cdc.gov/nip/publications/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

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This table is revised periodically. Visit IAC's website at www.immunize.org/childrules to make sure you have the most current version. IAC thanks William Atkinson, MD, MPH, from CDC's National Center for Immunization and Respiratory Diseases for his assistance. For more information, contact IAC at 1573 Selby Avenue, St. Paul, MN 55104, (651) 647-9009, or email admin@immunize.org. www.immunize.org/carg/childrules1.pdf • Item #P2010 (1/06)

Summary of Recommendations for Childhood and Adolescent Immunization

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Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccine administration and other related issues	Contraindications and precautions (mild illness is not a contraindication)
Varicella (Var) (Chickenpox) Give SC	<ul style="list-style-type: none"> Give dose #1 at age 12–15m. Give dose #2 at age 4–6yrs. Dose #2 may be given earlier if at least 3m since dose #1. Give a routine second dose to all older children and adolescents with history of only 1 dose. MMRV may be used in children 12m through 12yrs. 	<ul style="list-style-type: none"> If younger than age 1–3yrs, space dose #1 and #2 at least 3m apart. If age 1–3yrs or older, space 4–8wks apart. May use as postexposure prophylaxis if given within 3–5d. If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. 	Contraindications <ul style="list-style-type: none"> Previous anaphylaxis to this vaccine or to any of its components. Pregnancy or possibility of pregnancy within 4wks. Children immunocompromised because of high doses of systemic steroids, cancer, leukemia, lymphoma, or immunodeficiency. Note: For patients with humoral immunodeficiency, HIV infection, or leukemia, or for patients on high doses of systemic steroids, see ACIP recommendations*. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement <i>General Recommendations on Immunization*</i> regarding time to wait before vaccinating.
MMR (Measles, mumps, rubella) Give SC	<ul style="list-style-type: none"> Give dose #1 at age 12–15m. Give dose #2 at age 4–6yrs. Dose #2 may be given earlier if at least 4wks since dose #1. If a dose was given before age 12m, it doesn't count as the first dose, so give #1 at age 12–15m with a minimum interval of 4wks between the invalid dose and dose #1. MMRV may be used in children 12m through 12yrs. 	<ul style="list-style-type: none"> If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. When using MMR (not MMRV) for both doses, minimum interval is 4wks. 	Contraindications <ul style="list-style-type: none"> Previous anaphylaxis to this vaccine or to any of its components. Pregnancy or possibility of pregnancy within 4wks. Severe immunodeficiency (e.g., hematologic and solid tumors; congenital immunodeficiency; long-term immunosuppressive therapy, or severely symptomatic HIV). Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. If blood, plasma, or immune globulin given in past 11m or if on high-dose immunosuppressive therapy, see ACIP statement <i>General Recommendations on Immunization*</i> regarding delay time. History of thrombocytopenia or thrombocytopenic purpura. <p>Note: MMR is not contraindicated if a PPD (tuberculosis skin test) was recently applied. If PPD and MMR not given on same day, delay PPD for 4–6wks after MMR.</p>
Influenza Trivalent inactivated influenza vaccine (TIV) Give IM	<ul style="list-style-type: none"> On an annual basis, vaccinate all children ages 6–59m, as well as all siblings and household contacts of children ages 0–59m. Vaccinate persons 5yrs and older who have a risk factor (e.g., pregnancy, heart disease, lung disease, diabetes, renal dysfunction, hemoglobinopathy, immunosuppression, on long-term aspirin therapy, or have a condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration) or live in a chronic-care facility. Live attenuated influenza vaccine (LAIV) Give <i>intranasally</i> 	<ul style="list-style-type: none"> Vaccinate any person wishing to reduce the likelihood of becoming ill with influenza. LAIV may be given to healthy, non-pregnant persons ages 5–49yrs. Give 2 doses to first-time vaccinees ages 6m through 8yrs. For TIV, space 4wks apart; for LAIV, space 6wks apart (no younger than age 5yrs). For TIV, give 0.25 mL dose to children ages 6–35m and 0.5 mL dose if age 3yrs and older. 	Contraindications <ul style="list-style-type: none"> Previous anaphylaxis to this vaccine, to any of its components, or to eggs. For LAIV only: Pregnancy, asthma, reactive airway disease, or other chronic disorder of the pulmonary or cardiovascular systems; an underlying medical condition, including metabolic diseases such as diabetes, renal dysfunction, and hemoglobinopathies; a known or suspected immune deficiency disease or receiving immunosuppressive therapy; history of Guillain-Barré syndrome. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. For TIV only: History of Guillain-Barré syndrome within 6wks of previous TIV.
Rotavirus (Rota) Give orally	<ul style="list-style-type: none"> Give a 3-dose series at ages 2m, 4m, 6m. May give dose #1 as early as age 6wks. Give dose #3 no later than age 32wks. 	<ul style="list-style-type: none"> Do not begin series in infants older than age 12wks. Dose #2 and #3 may be given 4wks after previous dose. 	Contraindication <ul style="list-style-type: none"> Previous anaphylaxis to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Altered immunocompetence. Moderate to severe acute gastroenteritis or chronic gastrointestinal disease. History of intussusception.

Appendix A

Summary of Recommendations for Childhood and Adolescent Immunization

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Vaccine name and route	Schedule for routine vaccination and other guidelines (any vaccine can be given with another)	Schedule for catch-up vaccination and other related issues	Contraindications and precautions (mild illness is not a contraindication)
Hib <i>(Haemophilus influenzae type b)</i> Give IM	<ul style="list-style-type: none"> HibTITER (HbOC) and ActHib (PRP-T): give at 2m, 4m, 6m, 12–15m (booster dose). PedvaxHIB or Comvax (containing PRP-OMP): give at 2m, 4m, 12–15m. Dose #1 of Hib vaccine may be given no earlier than age 6wks. The last dose (booster dose) is given no earlier than age 12m and a minimum of 8wks after the previous dose. Hib vaccines are interchangeable; however, if different brands of Hib vaccines are administered, a total of three doses are necessary to complete the primary series in infants. Any Hib vaccine may be used for the booster dose. Hib is not routinely given to children age 5yrs and older. 	<p>All Hib vaccines:</p> <ul style="list-style-type: none"> If #1 was given at 12–14m, give booster in 8wks. Give only 1 dose to unvaccinated children from age 15m to 5yrs. HibTITER and ActHib: <ul style="list-style-type: none"> #2 and #3 may be given 4 wks after previous dose. If #1 was given at 7–11m, only 3 doses are needed; #2 is given 4–8wks after #1, then boost at 12–15m (wait at least 8wks after dose #2). PedvaxHIB and Comvax: <ul style="list-style-type: none"> #2 may be given 4wks after dose #1. <p>For ages 7–11m: If history of 0–2 doses, give additional doses 4wks apart with no more than 3 total doses by age 12m; then give booster 8wks later.</p> <ul style="list-style-type: none"> For ages 12–23m: If 0–1 dose before age 12m, give 2 doses at least 8wks apart. If 2–3 doses before age 12m, give 1 dose at least 8wks after previous dose. For ages 24–59m: If patient has had no previous doses, or has a history of 1–3 doses given before age 12m but no booster dose, or has a history of 1 dose given at 12–23m, give 1 dose now. 	<p>Contraindication</p> <p>Previous anaphylaxis to this vaccine or to any of its components.</p> <p>Precaution</p> <p>Moderate or severe acute illness.</p>
Pneumo. conjugate (PCV) Give IM	<ul style="list-style-type: none"> Give at ages 2m, 4m, 6m, 12–15m. Dose #1 may be given as early as age 6wks. Give 1 dose to unvaccinated healthy children ages 24–59m. Give 2 doses at least 8wks apart to unvaccinated high-risk** children ages 24–59m. PCV is not routinely given to children age 5yrs and older. 	<p>For ages 7–11m: If history of 0–2 doses, give additional doses 4wks apart with no more than 3 total doses by age 12m; then give booster 8wks later.</p> <ul style="list-style-type: none"> For ages 12–23m: If 0–1 dose before age 12m, give 2 doses at least 8wks apart. If 2–3 doses before age 12m, give 1 dose at least 8wks after previous dose. For ages 24–59m: If patient has had no previous doses, or has a history of 1–3 doses given before age 12m but no booster dose, or has a history of 1 dose given at 12–23m, give 1 dose now. 	<p>Contraindication</p> <p>Previous anaphylaxis to this vaccine or to any of its components.</p> <p>Precaution</p> <p>Moderate or severe acute illness.</p>
Pneumo. polysacch. (PPV) Give IM or SC	<p>**High-risk: Those with sickle cell disease; anatomic/functional asplenia; chronic cardiac, pulmonary, or renal disease; diabetes; cerebrospinal fluid leaks; HIV infection; immunosuppression; or who have or will have a cochlear implant.</p> <ul style="list-style-type: none"> Give 1 dose at least 8wks after final dose of PCV to high-risk children age 2yrs and older. For children who are immunocompromised or have sickle cell disease or functional or anatomic asplenia, give a 2nd dose of PPV 3–5yrs after previous PPV (consult ACIP PPV recommendations [MMWR 1997;46 [RR-8] for details*). 	<p>For ages 7–11m: If history of 0–2 doses, give additional doses 4wks apart with no more than 3 total doses by age 12m; then give booster 8wks later.</p> <ul style="list-style-type: none"> For ages 12–23m: If 0–1 dose before age 12m, give 2 doses at least 8wks apart. If 2–3 doses before age 12m, give 1 dose at least 8wks after previous dose. For ages 24–59m: If patient has had no previous doses, or has a history of 1–3 doses given before age 12m but no booster dose, or has a history of 1 dose given at 12–23m, give 1 dose now. 	<p>Contraindication</p> <p>Previous anaphylaxis to this vaccine or to any of its components.</p> <p>Precaution</p> <p>Moderate or severe acute illness.</p>
Hepatitis A Give IM	<ul style="list-style-type: none"> Give 2 doses to all children at age 1yr (12–23m) spaced 6m apart. Vaccinate all children and adolescents age 2 years and older who <ul style="list-style-type: none"> - Live in a state, county, or community with a routine vaccination program already in place for children ages 2yrs and older. - Travel anywhere except U.S., W. Europe, N. Zealand, Australia, Canada, or Japan. - Wish to be protected from HAV infection. - Have chronic liver disease, clotting factor disorder, or are MSM adolescents. 	<ul style="list-style-type: none"> Minimum interval between doses is 6m. Consider routine vaccination of children ages 2yrs and older in areas with no existing program. 	<p>Contraindication</p> <p>Previous anaphylaxis to this vaccine or to any of its components.</p> <p>Precaution</p> <p>Moderate or severe acute illness.</p>
Meningoococcal conjugate (MCV4) Give IM	<ul style="list-style-type: none"> Give 1-time dose of MCV4 to adolescents ages 11–12yrs, to adolescents at high school entry (approximately age 15yrs), and to college freshmen living in dormitories. Vaccinate all children age 2yrs and older who have any of the following risk factors (use MPSV4 if age younger than 11yrs and MCV4 if age 11yrs and older): <ul style="list-style-type: none"> - Anatomic or functional asplenia, or terminal complement component deficiencies. - Travel to, or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the “meningitis belt” of Sub-Saharan Africa). <p>Note: Other adolescents who wish to decrease their risk of meningococcal disease may be vaccinated with MCV4.</p>	<p>If previously vaccinated with MPSV4 and risk continues, give MCV4 5yrs after MPSV4.</p>	<p>Contraindication</p> <p>Previous anaphylaxis to this vaccine or to any of its components, including diphtheria toxoid (for MCV4).</p> <p>Precaution</p> <p>Moderate or severe acute illness.</p> <p>Note: MCV4 is not licensed for use in children younger than age 11 yrs.</p>

Summary of Recommendations for Adult Immunization

Adapted from the recommendations of the Advisory Committee on Immunization Practices (ACIP)* by the Immunization Action Coalition, September 2006

Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Influenza Trivalent inactivated influenza vaccine (TIV) <i>Give IM</i>	<ul style="list-style-type: none"> • Persons age 50yrs and older. • Persons with medical problems (e.g., heart disease, lung disease, diabetes, renal dysfunction, hemoglobinopathy, immunosuppression) and/or people living in chronic-care facilities. • Persons with any condition that compromises respiratory function or the handling of respiratory secretions or that can increase the risk of aspiration (e.g., cognitive dysfunction, spinal cord injury, seizure disorder, or other neuromuscular disorder). • Persons working or living with at-risk people. • Women who will be pregnant during the influenza season (December–March). • All healthcare workers and other persons who provide direct care to at-risk people. • Household contacts and out-of-home caregivers of children ages 0–59m. • Travelers at risk for complications of influenza who go to areas where influenza activity exists or who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours). • Persons who provide essential community services. • Students or other persons in institutional settings (e.g., dormitory residents). • Anyone wishing to reduce the likelihood of becoming ill with influenza. 	<ul style="list-style-type: none"> • Given every year in the fall or winter. • October and November are the ideal months to give TIV. • LAIV may be given as early as August. • Continue to give TIV and LAIV through the influenza season from December through March (including when influenza activity is present in the community) and at other times when the risk of influenza exists. 	Contraindication Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs. Precautions <ul style="list-style-type: none"> • Moderate or severe acute illness. • History of Guillain-Barré syndrome within 6wks of previous TIV.
Influenza Live attenuated influenza vaccine (LAIV) <i>Give intranasally</i>	<ul style="list-style-type: none"> • Healthy, non-pregnant persons age 49yrs and younger who meet any of the conditions listed below. - Working or living with at-risk people as listed in the section above. - Healthcare workers or other persons who provide direct care to at-risk people (except persons in close contact with severely immunosuppressed persons). - Household contacts and out-of-home caregivers of children ages 0–59m. - Travelers who may be among people from areas of the world where there is current influenza activity (e.g., on organized tours). - Persons who provide essential community services. - Students or other persons in institutional settings (e.g., dormitory residents). - Anyone wishing to reduce the likelihood of becoming ill with influenza. 	<ul style="list-style-type: none"> • Continue to give TIV and LAIV through the influenza season from December through March (including when influenza activity is present in the community) and at other times when the risk of influenza exists. 	Contraindications Previous anaphylactic reaction to this vaccine, to any of its components, or to eggs. Precautions <ul style="list-style-type: none"> • Pregnancy, asthma, reactive airway disease or other chronic disorder of the pulmonary or cardiovascular system; an underlying medical condition, including metabolic disease such as diabetes, renal dysfunction, and hemoglobinopathy; a known or suspected immune deficiency disease or receiving immunosuppressive therapy; history of Guillain-Barré syndrome.
Pneumococcal poly-saccharide (PPV) <i>Give IM or SC</i>	<ul style="list-style-type: none"> • Persons age 65yrs and older. • Persons who have chronic illness or other risk factors, including chronic cardiac or pulmonary disease, chronic liver disease, alcoholism, diabetes, CSF leak, as well as people living in special environments or social settings (including Alaska Natives and certain American Indian populations). Those at highest risk of fatal pneumococcal infection are persons with anatomic aplasia, functional asplenia, or sickle cell disease; immunocompromised persons including those with HIV, infection, leukemia, lymphoma, Hodgkin's disease, multiple myeloma, generalized malignancy, chronic renal failure, or nephrotic syndrome; persons receiving immunosuppressive chemotherapy (including corticosteroids); those who received an organ or bone marrow transplant; and candidates for or recipients of cochlear implants. 	<ul style="list-style-type: none"> • Routinely given as a one-time dose; administer if previous vaccination history is unknown. • One-time revaccination is recommended 5yrs later for persons at highest risk of fatal pneumococcal infection or rapid antibody loss (e.g., renal disease) and for persons age 65yrs and older if the 1st dose was given prior to age 65 and 5yrs or more have elapsed since the previous dose. 	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precaution Moderate or severe acute illness.

*For specific ACIP recommendations, refer to the official ACIP statements published in *MMWR*. To obtain copies of these statements, call the CDC-INFO Contact Center at (800) 232-4636; visit CDC's website at www.cdc.gov/nip/publications/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

This table is revised periodically. Visit IAC's website at www.immunize.org/adultrules to make sure you have the most current version. IAC thanks William Atkinson, MD, MPH, from CDC's National Center for Immunization and Respiratory Diseases for his assistance. For more information, contact IAC at 1573 Selby Avenue, St. Paul, MN 55104, (651) 647-9009, or email admin@immunize.org.
www.immunize.org/cag/difp2011_bp.pdf • Item #P2011 (9/06)

Appendix A

Summary of Recommendations for Adult Immunization (continued)

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Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Hepatitis B (Hep B) Give IM Brands may be used interchangeably.	<ul style="list-style-type: none"> All adolescents; any adult wishing to obtain immunity. High-risk persons, including household contacts and sex partners of HBsAg-positive persons; injecting drug users; heterosexuals with more than one sex partner in 6 months; men who have sex with men; persons with recently diagnosed STDs; patients receiving hemodialysis and patients with renal disease that may result in dialysis; recipients of certain blood products; healthcare workers and public safety workers who are exposed to blood; clients and staff of institutions for the developmentally disabled; inmates of long-term correctional facilities; and certain international travelers. Persons with chronic liver disease. <p>Note: Provide serologic screening for immigrants from endemic areas. When HBsAg-positive persons are identified, offer appropriate disease management. In addition, screen their sex partners and household members, and give the first dose of vaccine at the same visit. If found susceptible, complete the vaccine series.</p>	<ul style="list-style-type: none"> Three doses are needed on a 0, 1, 6m schedule. Alternative timing options for vaccination include 0, 2, 4m and 0, 1, 4m. There must be 4wks between doses #1 and #2, and 8wks between doses #2 and #3. Overall, there must be at least 16wks between doses #1 and #3. <p>Schedule for those who have fallen behind: If the series is delayed between doses, DO NOT start the series over. Continue from where you left off.</p>	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precaution Moderate or severe acute illness.
Hepatitis A (Hep A) Give IM Brands may be used interchangeably.	<ul style="list-style-type: none"> Persons who travel or work anywhere except the U.S., Western Europe, New Zealand, Australia, Canada, and Japan. Persons with chronic liver disease, including persons with hepatitis B and C; injecting and non-injecting drug users; men who have sex with men; people with clotting-factor disorders; persons who work with hepatitis A virus in experimental lab settings (not routine medical laboratories); and food handlers when health authorities or private employers determine vaccination to be cost effective. Anyone wishing to obtain immunity to hepatitis A. <p>Note: Prevaccination testing is likely to be cost effective for persons older than age 40yrs, as well as for younger persons in certain groups with a high prevalence of hepatitis A virus infection.</p>	<ul style="list-style-type: none"> Two doses are needed. The minimum interval between doses #1 and #2 is 6m. If dose #2 is delayed, do not repeat dose #1. Just give dose #2. 	Contraindication Previous anaphylactic reaction to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Safety during pregnancy has not been determined, so benefits must be weighed against potential risk.
Td, Tdap (Tetanus, diphtheria, pertussis) Give IM	<ul style="list-style-type: none"> All adults who lack a history of a primary series consisting of at least 3 doses of tetanus- and diphtheria-containing vaccine. A booster dose of tetanus- and diphtheria-containing toxoid may be needed for wound management as early as 5yrs after receiving a previous dose, so consult ACIP recommendations.* Using tetanus toxoid (TT) instead of Td or Tdap is not recommended. In pregnancy, when indicated, give Td or Tdap in 2nd or 3rd trimester. If not administered during pregnancy, give Tdap in immediate postpartum period. For Tdap (tetanus- and diphtheria-toxoids with acellular pertussis vaccine), only: All adults younger than age 65yrs who have not received Tdap. Healthcare workers who work in hospitals or ambulatory care settings and have direct patient contact and who have not received Tdap. Adults in contact with infants younger than age 12m (e.g., parents, grandparents younger than age 65yrs, childcare providers, healthcare workers) who have not received a dose of Tdap. 	<ul style="list-style-type: none"> For persons who are unvaccinated or behind, complete the primary series with Td (spaced at 0, 1–2m, 6–12m intervals). One dose of Tdap may be used for any dose if ages 19–64yrs. Give Td booster every 10yrs after the primary series has been completed. For adults ages 19–64yrs, a 1-time dose of Tdap is recommended to replace the next Td. Intervals of 2yrs or less between Td and Tdap may be used if needed. <p>Note: The 2 Tdap products are licensed for different age groups: Adacel (sanofi) for use in persons ages 11–64yrs and Boostrix (GSK) for use in persons ages 10–18yrs.</p>	Contraindications Previous anaphylactic reaction to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Gullain-Barré syndrome within 6wks of receiving a previous dose of tetanus toxoid-containing vaccine. Unstable neurologic condition. <p>Note: Use of Td or Tdap is not contraindicated in pregnancy. At the provider's discretion, either vaccine may be administered during the 2nd or 3rd trimester.</p>
Polio (IPV) Give IM or SC	<p>Not routinely recommended for persons age 18yrs and older.</p> <p>Note: Adults living in the U.S. who never received or completed a primary series of polio vaccine need not be vaccinated unless they intend to travel to areas where exposure to wild-type virus is likely (i.e., India, Pakistan, Afghanistan, and certain countries in Africa). Previously vaccinated adults can receive one booster dose if traveling to polio endemic areas.</p>	<p>Refer to ACIP recommendations* regarding unique situations, schedules, and dosing information.</p>	Contraindication Previous anaphylactic or neurologic reaction to this vaccine or to any of its components. Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. Pregnancy.

Summary of Recommendations for Adult Immunization (continued)

(Page 3 of 3)

Vaccine name and route	For whom vaccination is recommended	Schedule for vaccine administration (any vaccine can be given with another)	Contraindications and precautions (mild illness is not a contraindication)
Varicella (Var) (Chickenpox) Give SC	All adults without evidence of immunity. Immunity is defined as any one of the following: • history of two doses of Var born in the U.S. before 1980 • history of varicella disease or herpes zoster based on healthcare provider diagnosis • laboratory evidence of immunity or laboratory confirmation of disease	<ul style="list-style-type: none"> Two doses are needed. Dose #2 is given 4-8wks after dose #1. If Var and either MMR, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. If the second dose is delayed, do not repeat dose #1. Just give dose #2. 	Contraindications <ul style="list-style-type: none"> Previous anaphylactic reaction to this vaccine or to any of its components. Pregnancy or possibility of pregnancy within 4wks. Persons immunocompromised because of malignancies and primary or acquired cellular immunodeficiency including HIV/AIDS. (See <i>MMWR</i> 1999, Vol. 48, No. RR-6.) Note: For those on high-dose immunosuppressive therapy, consult ACIP recommendations regarding delay time.* Precautions <ul style="list-style-type: none"> If blood, plasma, and/or immune globulin (IG or VZIG) were given in past 11m, see ACIP statement <i>General Recommendations on Immunization*</i> regarding time to wait before vaccinating. Moderate or severe acute illness.
Meningo- coccal Conjugate vaccine (MCV4) Give IM Poly-saccharide vaccine (MPSV4) Give SC	<ul style="list-style-type: none"> College freshmen living in dormitories. Adolescents and adults with anatomic or functional asplenia or with terminal complement component deficiencies. Persons who travel to or reside in countries in which meningococcal disease is hyperendemic or epidemic (e.g., the "meningitis belt" of Sub-Saharan Africa). Microbiologists who are routinely exposed to isolates of <i>N. meningitidis</i>. 	<ul style="list-style-type: none"> One dose is needed. If previous vaccine was MPSV4, revaccinate after 5yrs if risk continues. Revaccination after MCV4 is not recommended. MCV4 is preferred over MPSV4 for persons age 55yrs and younger, although MPSV4 is an acceptable alternative. 	Contraindication <ul style="list-style-type: none"> Previous anaphylactic or neurologic reaction to this vaccine or to any of its components, including diphtheria toxoid (for MCV4). Precautions <ul style="list-style-type: none"> Moderate or severe acute illness. For MCV4 only, history of Guillain-Barré syndrome.
MMR (Measles, mumps, rubella) Give IM Give SC	<ul style="list-style-type: none"> Persons born in 1957 or later (especially those born outside the U.S.) should receive at least one dose of MMR if there is no serologic proof of immunity or documentation of a dose given on or after the first birthday. Persons in high-risk groups, such as healthcare workers, students entering college and other post-high school educational institutions, and international travelers, should receive a total of two doses. Persons born before 1957 are usually considered immune, but proof of immunity (serology or vaccination) may be desirable for healthcare workers. Women of childbearing age who do not have acceptable evidence of rubella immunity or vaccination. 	<ul style="list-style-type: none"> One or two doses are needed. If dose #2 is recommended, give it no sooner than 4wks after dose #1. If MMR and either Var, LAIV, and/or yellow fever vaccine are not given on the same day, space them at least 28d apart. If a pregnant woman is found to be rubella susceptible, administer MMR postpartum. 	Contraindications <ul style="list-style-type: none"> Previous anaphylactic reaction to this vaccine or to any of its components. Pregnancy or possibility of pregnancy within 4wks. Persons immunocompromised because of cancer, leukemia, lymphoma, immunosuppressive drug therapy, including high-dose steroids or radiation therapy. Note: HIV positivity is NOT a contraindication to MMR except for those who are severely immunocompromised. Precautions <ul style="list-style-type: none"> If blood, plasma, and/or immune globulin were given in past 11m, see ACIP statement <i>General Recommendations on Immunization*</i> regarding time to wait before vaccinating. Moderate or severe acute illness. History of thrombocytopenia or thrombocytopenic purpura. Note: If PPD (tuberculosis skin test) and MMR are both needed but not given on same day, delay PPD for 4-6wks after MMR.
Human-papillomavirus (HPV) Give IM	All previously unvaccinated women through age 26yrs.	<ul style="list-style-type: none"> Three doses are needed. Dose #2 is given 4-8wks after dose #1, and dose #3 is given 6m after dose #1 (at least 12wks after dose #2). 	Contraindication <ul style="list-style-type: none"> Previous anaphylactic reaction to this vaccine or to any of its components. Precaution <ul style="list-style-type: none"> Data on vaccination in pregnancy are limited; therefore, vaccination during pregnancy should be delayed until after completion of the pregnancy.
Zoster (shingles)	A herpes zoster (shingles) vaccine was licensed in May 2006 for use in persons age 60yrs and older. ACIP recommendations for its use are pending. Refer to the package insert for details on its use.		

Appendix A

Suggested intervals between administration of immune globulin preparations and measles- or varicella-containing vaccine*

*Does not include zoster vaccine (Zostavax)

Product / Indication	Dose, including mg immunoglobulin G (IgG)/kg body weight	Recommended interval before measles or varicella-containing vaccine administration
RSV monoclonal antibody (Synagis™) ¹	15 mg/kg intramuscularly (IM) 250 units (10 mg IgG/kg) IM	None 3 months
Tetanus IG (TIG)		
Hepatitis A IG		
Contact prophylaxis	0.02 mL/kg (3.3 mg IgG/kg) IM	3 months
International travel	0.06 mL/kg (10 mg IgG/kg) IM	3 months
Hepatitis B IG (HBIG)	0.06 mL/kg (10 mg IgG/kg) IM	3 months
Rabies IG (RIG)	20 IU/kg (22 mg IgG/kg) IM	4 months
Measles prophylaxis IG		
Standard (i.e., nonimmunocompromised) contact	0.25 mL/kg (40 mg IgG/kg) IM 0.50 mL/kg (80 mg IgG/kg) IM	5 months 6 months
Immunocompromised contact		
Blood transfusion		
Red blood cells (RBCs), washed RBCs, adenine-saline added	10 mL/kg negligible IgG/kg intravenously (IV) 10 mL/kg (10 mg IgG/kg) IV	None 3 months
Packed RBCs (Hct 65%) ²	10 mL/kg (60 mg IgG/kg) IV	6 months
Whole blood (Hct 35%-50%) ²	10 mL/kg (80-100 mg IgG/kg) IV	6 months
Plasma/platelet products	10 mL/kg (160 mg IgG/kg) IV	7 months
Cytomegalovirus intravenous immune globulin (IGIV)	150 mg/kg maximum	6 months
IGIV		
Replacement therapy for immune deficiencies ³	300-400 mg/kg IV ³	8 months
Immune thrombocytopenic purpura	400 mg/kg IV	8 months
Immune thrombocytopenic purpura	1000 mg/kg IV	10 months
Postexposure varicella prophylaxis ⁴	400 mg/kg IV	8 months
Kawasaki disease	2 g/kg IV	11 months

This table is not intended for determining the correct indications and dosages for using antibody-containing products. Unvaccinated persons might not be fully protected against measles during the entire recommended interval, and additional doses of immune globulin or measles vaccine might be indicated after measles exposure. Concentrations of measles antibody in an immune globulin preparation can vary by manufacturer's lot. Rates of antibody clearance after receipt of an immune globulin preparation also might vary. Recommended intervals are extrapolated from an estimated half-life of 30 days for passively acquired antibody and an observed interference with the immune response to measles vaccine for 5 months after a dose of 80 mg IgG/kg.

1 Contains antibody only to respiratory syncytial virus.

2 Assumes a serum IgG concentration of 16 mg/ml.

3 Measles and varicella vaccinations are recommended for children with asymptomatic or mildly symptomatic human immunodeficiency virus (HIV) infection but are contraindicated for persons with severe immunosuppression from HIV or any other immunosuppressive disorder.

4 The investigational product VarizIG, similar to licensed VZIG, is a purified human immune globulin preparation made from plasma containing high levels of anti-varicella antibodies (immunoglobulin class G [IgG]). When indicated, health-care providers should make every effort to obtain and administer VarizIG. In situations in which administration of VarizIG does not appear possible within 96 hours of exposure, administration of immune globulin intravenous (IGIV) should be considered as an alternative. IGIV also should be administered within 96 hours of exposure. Although licensed IGIV preparations are known to contain anti-varicella antibody titers, the titer of any specific lot of IGIV that might be available is uncertain because IGIV is not routinely tested for antivariella antibodies. The recommended IGIV dose for postexposure prophylaxis of varicella is 400 mg/kg, administered once. For a pregnant woman who cannot receive VarizIG within 96 hours of exposure, clinicians can choose either to administer IGIV or closely monitor the woman for signs and symptoms of varicella and institute treatment with acyclovir if illness occurs. (CDC. A new product for postexposure prophylaxis available under an investigational new drug application expanded access protocol. *MMWR* 2006;55:209-10.)

Healthcare Worker Vaccination Recommendations

Vaccine	Recommendations in brief
Hepatitis B	Give 3-dose series (dose #1 now, #2 in 1 month, #3 approximately 5 months after #2). Give IM. Obtain anti-HBs serologic testing 1–2 months after dose #3.
Influenza	Give 1 dose of TIV or LAIV annually. Give IM or intranasally, respectively.
MMR	For persons born in 1957 or later without serologic evidence of immunity or prior vaccination, give 2 doses of MMR, 4 weeks apart. Give SC.
Varicella (chickenpox)	For persons who have no serologic proof of immunity, prior vaccination, or history of varicella disease, give 2 doses of varicella vaccine, 4 weeks apart. Give SC.
Tetanus, diphtheria, pertussis	All adults need a Td booster dose every 10 years, following the completion of the primary 3-dose series. All HCWs younger than 65 years with direct patient contact should receive a 1-time dose of Tdap. Give IM.
Meningococcal	Give 1 dose to microbiologists who are routinely exposed to isolates of <i>N. meningitidis</i> .

Hepatitis A, typhoid, and polio vaccines are not routinely recommended for HCWs who may have on-the-job exposure to fecal material.

Hepatitis B

Healthcare workers (HCWs) who perform tasks that may involve exposure to blood or body fluids should receive a 3-dose series of hepatitis B vaccine at 0-, 1-, and 6-month intervals. Test for hepatitis B surface antibody (anti-HBs) to document immunity 1–2 months after dose #3.

- If anti-HBs is at least 10 mIU/mL (positive), the patient is immune. No further serologic testing or vaccination is recommended.
- If anti-HBs is less than 10 mIU/mL (negative), the patient is unprotected from hepatitis B virus (HBV) infection; revaccinate with a 3-dose series. Retest anti-HBs 1–2 months after dose #3.
 - If anti-HBs is positive, the patient is immune. No further testing or vaccination is recommended.
 - If anti-HBs is negative following 6 doses of vaccine, the patient is a non-responder.

For non-responders: Persons who are non-responders should be considered susceptible to HBV and should be counseled regarding precautions to prevent HBV infection and the need to obtain HBIG prophylaxis for any known or probable parenteral exposure to hepatitis B surface antigen (HBsAg)-positive blood.¹ It is also possible that non-responders are persons who are HBsAg positive. Testing should be considered. Persons found to be HBsAg positive should be counseled and medically evaluated.

Note: Anti-HBs testing is not recommended routinely for previously vaccinated HCWs who were not tested 1–2 months after their original vaccine series. These HCWs should be tested for anti-HBs when they have an exposure to blood or body fluids. If found to be anti-HBs negative, the HCW should be treated as if susceptible.¹

Influenza

Trivalent (Inactivated) Influenza Vaccine (TIV): May give to any HCW. **Live, Attenuated Influenza Vaccine (LAIV):** May give to any non-pregnant healthy HCW age 49 years and younger.

1. All HCWs should receive annual influenza vaccine. Groups that should be targeted include all personnel (including volunteers) in hospitals, outpatient, and home-health settings who have any patient contact.
2. TIV is preferred over LAIV for HCWs who are in close contact with severely immunosuppressed persons (e.g., stem cell transplant patients) when patients require a protective environment.

Measles, Mumps, Rubella (MMR)

Persons who work in medical facilities should be immune to measles, mumps, and rubella.

- Persons born in 1957 or later can be considered immune to measles, mumps, or rubella only if they have documentation of (a) physician-diag-

nosed measles or mumps disease; or (b) laboratory evidence of measles, mumps, or rubella immunity (persons who have an “indeterminate” or “equivocal” level of immunity upon testing should be considered nonimmune); or (c) appropriate vaccination against measles, mumps, and rubella (i.e., administration on or after the first birthday of two doses of live measles and mumps vaccines separated by 28 days or more, and at least one dose of live rubella vaccine).

- Although birth before 1957 generally is considered acceptable evidence of measles, mumps, and rubella immunity, healthcare facilities should consider recommending a dose of MMR vaccine to unvaccinated HCWs born before 1957 who are in either of the following categories: (a) do not have a history of physician-diagnosed measles and mumps disease or laboratory evidence of measles and mumps immunity and (b) do not have laboratory evidence of rubella immunity.

Varicella

It is recommended that all HCWs be immune to varicella. Evidence of immunity in HCWs includes documentation of 2 doses of varicella vaccine given at least 28 days apart, history of varicella or herpes zoster based on physician diagnosis, laboratory evidence of immunity, or laboratory confirmation of disease.

Tetanus/Diphtheria/Pertussis (Td/Tdap)

All adults who have completed a 3-dose primary series of a tetanus/diphtheria-containing product (DTP, DTaP, DT, Td) should receive Td boosters every 10 years. As soon as feasible, HCWs younger than age 65 years with direct patient contact should be given a 1-time dose of Tdap.

Meningococcal

Vaccination is recommended for microbiologists who are routinely exposed to isolates of *N. meningitidis*. Use of MCV4 is preferred among persons ages 11–55 years; give IM. If MCV4 is unavailable, MPSV is an acceptable alternative for persons ages 11–55 years. Use of MPSV is recommended for persons older than age 55; give SC.

References

1. See Table 3 in “Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis,” *MMWR*, June 29, 2001, Vol. 50, RR-11.

For additional specific ACIP recommendations, refer to the official ACIP statements published in *MMWR*. To obtain copies, visit CDC’s website at www.cdc.gov/nip/publications/ACIP-list.htm; or visit the Immunization Action Coalition (IAC) website at www.immunize.org/acip.

Adapted with thanks from the Michigan Department of Community Health

Appendix A

Vaccination of Persons with Primary and Secondary Immune Deficiencies

PRIMARY					
Category	Specific Immunodeficiency	Contraindicated Vaccines ¹	Risk-Specific Vaccines ¹	Recommended Vaccines ¹	Effectiveness & Comments
B-lymphocyte (humoral)	Severe antibody deficiencies (e.g., X-linked agammaglobulinemia and common variable immunodeficiency)	OPV ² Smallpox LAIV BCG Ty21a (live oral typhoid)	Pneumococcal Influenza (TIV) Consider measles and varicella vaccination.	Pneumococcal Influenza (TIV)	The effectiveness of any vaccine will be uncertain if it depends only on the humoral response; IgIV interferes with the immune response to measles vaccine and possibly varicella vaccine.
	Less severe antibody deficiencies (e.g., selective IgA deficiency and IgG subclass deficiency)	OPV ² Other live vaccines appear to be safe.	Pneumococcal Influenza (TIV)	Pneumococcal Influenza (TIV)	All vaccines probably effective. Immune response may be attenuated.
	Complete defects (e.g., severe combined immunodeficiency [SCID] disease, complete DiGeorge syndrome)	All live vaccines ^{3,4}	Pneumococcal Influenza (TIV)	Pneumococcal Influenza (TIV)	Vaccines may be ineffective.
T-lymphocyte (cell-mediated and humoral)	Partial defects (e.g., most patients with DiGeorge syndrome, Wiskott-Aldrich syndrome, ataxiatelangiectasia)	All live vaccines ^{3,4}	Pneumococcal Meningococcal Hib (if not administered in infancy) Influenza (TIV)	Pneumococcal Meningococcal Hib (if not administered in infancy) Influenza (TIV)	Effectiveness of any vaccine depends on degree of immune suppression.
Complement	Deficiency of early components (C1-C4), late components (C5-C9), properdin, factor B.	None	Pneumococcal Meningococcal Influenza (TIV)	Pneumococcal Meningococcal Influenza (TIV)	All routine vaccines probably effective.
Phagocytic function	Chronic granulomatous disease, leukocyte adhesion defects, and myeloperoxidase deficiency.	Live bacterial vaccines ³	Pneumococcal ⁵ Influenza (TIV) (to decrease secondary bacterial infection).	Pneumococcal ⁵ Influenza (TIV) (to decrease secondary bacterial infection).	All inactivated vaccines safe and probably effective. Live viral vaccines probably safe and effective.

¹ Other vaccines that are not specifically contraindicated may be used if otherwise indicated.

² OPV is no longer available for routine use in the United States.

³ Live bacterial vaccines: BCG, and Ty21a *Salmonella typhi* vaccine.

⁴ Live viral vaccines: MMR, OPV, LAIV, yellow fever, varicella (including MMRV and HZ vaccine), and vaccinia (smallpox). Smallpox vaccine is not recommended for children or the general public.

⁵ Pneumococcal vaccine is not indicated for children with chronic granulomatous disease.

Vaccination of Persons with Primary and Secondary Immune Deficiencies

Specific Immunodeficiency	SECONDARY		
	Contraindicated Vaccines ¹	Recommended Vaccines ¹	Effectiveness & Comments
HIV/AIDS	OPV ² Smallpox BCG LAIV	Influenza (TIV) Pneumococcal Consider Hib (if not administered in infancy) and Meningococcal vaccination.	MMR, varicella, and all inactivated vaccines, including inactivated influenza, might be effective. ³
Malignant neoplasm, transplantation, immunosuppressive or radiation therapy	Withhold MMR and varicella in severely immunocompromised persons.	Live viral and bacterial, depending on immune status. ^{4,5}	Influenza (TIV) Pneumococcal
Asplenia	Malignant neoplasm, transplantation, immunosuppressive or radiation therapy	Pneumococcal Meningococcal Hib (if not administered in infancy)	Effectiveness of any vaccine depends on degree of immune suppression. All routine vaccines probably effective.
Chronic renal disease	None	Pneumococcal Influenza (TIV) Hepatitis B	All routine vaccines probably effective.
	LAIV		All routine vaccines probably effective.

¹ Other vaccines that are not specifically contraindicated may be used if otherwise indicated.

² OPV is no longer available for routine use in the United States.

³ HIV-infected children should receive IgG after exposure to measles, and may receive varicella and measles vaccine if CD4+ lymphocyte count is ≥15%.

⁴ Live viral vaccines: MMR, OPV, LAIV, yellow fever, varicella (including MMRV and HZ vaccine), and vaccinia (smallpox). Smallpox vaccine is not recommended for children or the general public.

⁵ Live bacterial vaccines: BCG, and Ty21a *Salmonella typhi* vaccine.

AIDS: Acquired Immunodeficiency Syndrome

BCG: Bacilli Calmette-Guerin vaccine

Hib: *Haemophilus influenzae* type b vaccine

HIV: Human Immunodeficiency Virus

IGIV: Immune Globulin Intravenous

IG: Immunoglobulin
LAIV: Live, Attenuated Influenza Vaccine
MMR: Measles, Mumps, Rubella vaccine
OPV: Oral Poliovirus Vaccine (live)
TIV: Trivalent (inactivated) Influenza Vaccine

Modified from American Academy of Pediatrics. Passive Immunization. In: Pickering LK, Baker C, Long S, McMillen J, ed. *Red Book: 2006 Report of the Committee on Infectious Diseases*. 27th ed. Elk Grove Village, IL: American Academy of Pediatrics; 2006: [71-72] and CDC. General Recommendations on Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006; 55 (No. RR-15).

Appendix A

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